ORIGINAL ARTICLE

Different Head Sizes of Femoral Component: Does this Difference Have an Impact on Outcome after total Hip Arthroplasty?

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ABSTRACT

Aim: To compare the outcome in femoral head replacement of different head sizes (28mm vs. 32mm) for total hip arthroplasty (THA).
Study design: Randomized controlled trial.
Place and duration of study: Department of orthopaedics, LGH, Lahore during 01-01-2018 to 31-12-2018.
Methodology: In this study the cases of either gender with age more than 40 years undergoing total hip arthroplasty were included and divided into two equal groups. The cases in group A were managed by head size 32mm or smaller and those in group B with 36mm or larger. These cases were followed after surgery regarding their outcome on the basis ofHarris Hip Score (HHS), rate of hip dislocation and pain at 6 months where the final outcome was seen.
Results: In the present study there were total 60 cases (30 in each group). The mean age of the participants was 65.33±8.37 vs. 64.41±9.13 years with p= 0.87 in group A and B. There were 19 (63.33%) males in group A and 20 (66.67%) in group B (p= 1.0). Mean Harris Hip score before treatment was 30.51±10.11 vs. 31.57±9.39 (p= 1.0) and post treatment it was 67.19±17.63 vs.83.34±13.57 with p= 0.02 in group A and B respectively. Mean pain on VAS was 1.78±0.39 vs.2.78±0.47 (p= 0.13) in group A and group B respectively. Two patients from group A presented with dislocation within 1 year after THA.
Conclusion: Larger head size is better than the smaller one in hip arthroplasty when it comes to Harris Hip score and rate of dislocation,but smaller head size is better in terms of post operative groin pain.
Key words: Harris Hip Score, Total Hip Arthoplasty, Femoral head, Pain.

INTRODUCTION

Total hip arthoplasty is not an uncommon procedure now a days and there are number of cases who need this surgery or come for follow up in orthopaedic clinics and admitted to indoors for various complications associated with this.[1]The selection of the appropriate head size of femoral component is one of the most important steps that is of concern as it can impact the outcome in various ways and can have both a detrimental as well as relieving affect on one's morbidity after the procedure[2-3].

Femoral head size has been discussed immensely in the past and the size was started from 22 mm in the early 1960 and then the majority of the work was done with relatively larger sizes due to various complications associated with smaller ones. The major concerns were dislocation, degree of pain and range of motions after the procedures[4-5].

Larger head size has the better outcome in terms of range of motion and lesser likelihood of dislocation, but on the other hand, the wear and tear and degree of pain associated with this are the major concerns and vice versa is seen with smaller heads. After the advent of XLPE sockets which are relatively resistant to day to day wears and tears, the use of larger head size is being preferred and practiced[5-6].

Received on 13-02-2019
Accepted on 12-07-2019

The major outcomes associated with this include, the change in range of motion, frequency of dislocations, functional status, degree of pain etc. Furthermore, there are number of scoring systems to label the outcomes and the most commonly practiced in Harris Hip Score (HHS). The major factors that can affect the outcomes include obesity, pre procedure stiffness, limitation, type of surgical approach, soft tissue injury and characteristics of implant etc[6-8].

The objective of the study was to compare the outcome of different femoral head sizes (36mm or more vs 32mm or less) for total hip arthroplasty.

MATERIAL AND METHODS

This randomized controlled trial was done at Department of orthopaedics, Lahore General Hospital, Lahore from January to December 2018. In this study the cases of either gender or age more than 40 years undergoing total hip arthroplasty for advance osteoarthritis were included in this study. The cases with any bleeding disorder, those having end stage renal or liver failure and those with severe osteoporosis were excluded from this study. Patients were divided into two equal groups with a ratio of 1:1 via non probability consecutive sampling through sealed opaque envelope method labelled as A or B. The cases in group A were managed by head size 32 mm or less (28mm) and those in group B with 36mm or more. Cementless total hip replacement was done in all cases. All surgeries were performed through Hardinge approach.

Corresponding acetabular cup sizes were used depending on femoral head sizes. Then these cases were followed after surgery regarding their outcome on the basis of Harris Hip Score at 1 month, 3 months and 6 months.

SPSS version 23.0 was used to assess and analyse the data. Quantitative variables were presented as mean and standard deviation while qualitative variables as frequency and percentages. Effect modifiers were controlled and post stratification independent sample t test and Chi square tests were used for quantitative and qualitative data respectively taking p value of ≤ 0.05 was considered as significant.

RESULTS

In the present study there were total 60 cases (30 in each group). The mean age of the participants was 65.33±8.37 vs 64.41±9.13 years with p= 0.87 in group A and B (Table I) and mean duration of symptoms was 2.31±0.83 vs 2.79±0.57 with p= 0.78. There were 19 (63.33%) males in group A and 20 (66.67%) in group B (p= 1.0) (Figure I).

Mean Harris Hip score pre treatment was 30.51±10.11 vs. 31.57±9.39 (p= 1.0) and post treatment it was 67.19±17.63 vs. 83.34±13.57 with p= 0.02in group A and group B respectively, as shown in table II. Mean pain on VAS was 1.78±0.39 vs. 2.78±0.47 (p= 0.13) in group A and group B respectively as displayed in table III.

When it comes to dislocation, two patients suffered hip dislocation, both of them belonging to Group A. Apart from smaller head size, no other cause was identified in both patients.

Fig. I. Distribution of patients as per Gender

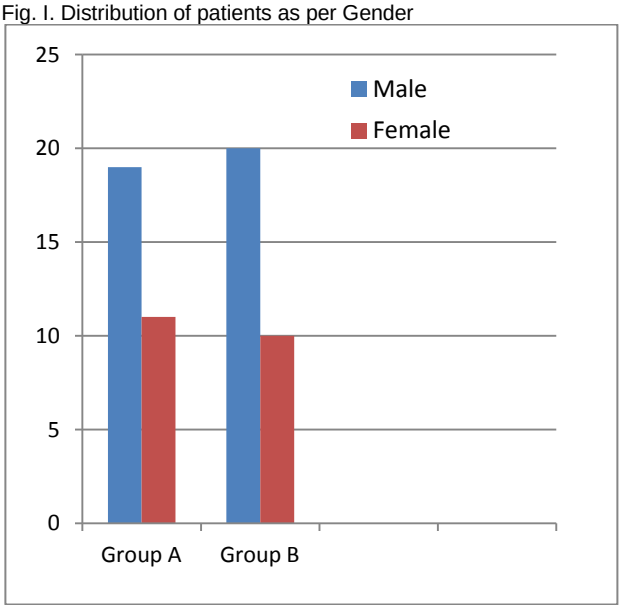

Table I. Study variables

Variables	Group A	Group B	P value
	Mean±SD	Mean±SD	
Age (years)	65.33±8.37	64.41±9.13	0.87
Duration of symptoms (yrs)	2.31±0.83	2.79±0.57	0.78
BMI	27.67±2.78	36 or more.57±3.12	0.93

Table II. Comparison of Harris Hip score

Variables	Group		p value
	A (32 or less)	B (36 or more)	
Harris Hip Score (pre)	30.51±10.11	31.57±9.39	1.0
Harris Hip Score (post)	67.19±17.63	83.34±13.57	0.02

Table III. Comparison of Outcome in terms of Pain

Variables	Group		p value
	A	B	
Pain on VAS (Pre-op)	6.20±1.48	5.80±0.39	0.84
Pain on VAS (Post-op)	1.78±0.39	2.78±0.47	0.13

DISCUSSION

Hip joint arthritis is a highly morbid entity and affects the day to day activities. A huge amount of pain killer consumption and in result the development of the co morbid conditions at higher ages especially gastric complications can further worsen the clinical status without the definitive treatment and hence add to the overall morbidity in such cases. Total hip arthoplasty has shown answers to these issues but the selection of the appropriate size and material is a matter of concern especially when it comes to wear and tear, dislocation of the joints, range of motion and pain relief. The most commonly practiced head size replacements are 36 or more mm and 32 mm with variable degree of success and outcome depending upon variable underlying factors and individual responses[9-11].

In the present study 36 or more mm size was compared with 32 mm in hip arthoplasty and it was seen that there was significant improvement in Mean Harris Hip score post treatment with 36 mm size, where it was seen as 83.34±13.57 vs. 67.19±17.63 with p= 0.02. These results were comparable to the findings of the previous studies. In a study done by Rizk AS et al mean pre and post HHS was 32.6±10.47 vs. 92.3±14.5 with p value less than 0.001.[12]These findings were again in the line of the results of the previous studies where the larger head size yielded a better range of motion to carry out daily life activities as compared to smaller ones compared[13-17].

Mean pain on VAS was 1.78±0.39 vs. 2.78±0.47 (p= 0.13) in group A and B respectively; though this difference was not statistically significantly. Few of the studies have found various factors to affect the pain and include larger head size, female gender, excessive mobility and various changes in surgical techniques that can result in lesser degree of pain in such cases[18-20].

CONCLUSION

Larger head size is better than the smaller one in hip arthroplasty and this difference is significantly better in terms of mean Harris Hip score and rate of hip dislocation. However, overall all degree of pain is relatively higher in large size head.

Conflict of interest: The author has no conflict of interest.

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